

MONETARY POLICY DYNAMICS AND MACROECONOMIC PERFORMANCE IN WAMZ COUNTRIES: A VAR APPROACH

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DOI: 10.29816/sjss.8.2.5

ABSTRACT

The pre-occupation of this study is to assess the relative effectiveness of monetary policy on macroeconomic performance in WAMZ Countries and to also ascertain if there is real convergence in the zone. The study leans on secondary source of data which was generated from West Africa Monetary Institute Data Bank and World Development Indicators (WDI, 2016). Vector Autoregressive (VAR) model is employed which was based on a modified version of the Taylors' principle, while the growth equation static panel analyses was used to test for real convergence in the region, the VAR model was analysed using the Impulse Response Functions (IRFs). The results revealed that in the WAMZ countries, monetary policy has almost no effect on growth in Nigeria, Ghana and Sierra Leone, but monetary policy shock increases growth in first quarters and decline towards second quarters in Liberia and Gambia. The response of inflation to monetary policy shock is similar in Nigeria, Ghana and Liberia but was positive in Gambia and Sierra Leone. The convergence results from the fixed effect regression suggest that there were no conditional convergence among West African Monetary Zone countries. The study concludes that member countries should try to meet up with the monetary union integration criteria by adopting similar monetary policy and hence these countries could be better off surrendering the inferior output growth approach to a supra-national monetary authority that compels compliance to a regional monetary and growth targets.

Keywords: Optimum Currency Area, Monetary Policy, Macro economic performance, WAMZ&VAR

I. Introduction and Issues of Concerns

One of the philosophies of New Economic Partnership for Africa's Development (NEPAD), the operational arm of the African Union (AU), is acceleration of regional and continental

integration. These are seen as a way to generate economies of scale found in larger markets and ensure solidarity in Africa. It is true that most African countries are small

judging by their per capita incomes and population sizes. As a result, they fail to provide potential investors with enough VARIety in investment opportunities and attractive returns. In the United Nations Economic Commission for Africa (UNECA, 2004) report, it is stated that NEPAD was set up to provide a development framework premised on regional integration, among other things. The report further stipulates that given the challenges posed by regionalism and globalization, African countries stand a better chance if they act collectively to reduce marginalization in the global economy.

The objective of the African Union (AU) is to have an African Economic Community (AEC) by the year 2028 with a single central bank and a common currency for the African continent. To achieve this goal, the AU tasked the African Regional Economic Communities (RECs) to accelerate their regional economic integration efforts and attain the status of an economic and monetary union (EMU) much earlier than the target for the establishment of the AEC. The AU envisions that the achievements of the RECs will be building blocks for the AEC (Economic Commission for Africa, 2004:31). West Africa Economic Monetary Union is one of the RECs given the mandate of reaching the status of an economic and monetary union (EMU). After the independence of WAEMU countries in 1960's, most of the countries are striving to achieve sustainable economic growth and development. The poor growth performance of the zone over the recent years is often ascribed to the ineptitude of Macroeconomic policies undertaken. Indeed, it has been argued in literature on currency unions that inappropriate monetary policy can deteriorate the economy of the member countries. As an institution aiding some of the poorest countries in the world, WAEMU's central bank Banque Centrale des Etats de l'Afrique de l'Ouest (BCEAO) has been

critiqued for its implementation of monetary policy without any concern for economic growth and development (Combey & Nubukpo, 2010). Its objective to sustain inflation below 2% is seen by economists as unjustifiably restrictive, since studies have shown that optimal threshold inflation rate of the zone is 8.1% (Combey & Nubukpo, 2010). Following Nubukpo (2011), these countries are paying a high social price, which is economic growth, for the degree of price stability they are experiencing. Furthermore, the fiscal policy implemented in the zone especially quality of government spending and the relevance of the convergence criteria adopted in the context of the regional convergence pact have been wholly criticize. Regarding relevance of the convergence criteria, Nubukpo (2011) disputed that efforts to obey the criteria especially the required balanced budget criterion can be counter-productive, leading the economy to recession. He also argued that the compliance to the balanced budget criterion in the short run will tend to create disequilibrium in the long run; because it prevents government investment expenditures that can generate growth. The problem then is the inappropriate monetary-fiscal policy mix in WAEMU countries.

The desire to evolve a common currency for the ECOWAS sub region has been in the offing since the birth of the regional integration body. This was considered expedient given the fact that there exist in the sub region one of the oldest monetary union – Union Economique et Monétaire Ouest Africaine (UEMOA). This informed the setting up of the 2nd West African Monetary Zone (WAMZ), proposed for non UEMOA, as a prelude and “fast-track” approach to ultimate unification and adoption of a common ECOWAS currency. The key elements of the fast-track approach require the need for these countries to pursue both monetary and fiscal policies that could lead to macroeconomic

convergence. Therefore, monetary policies which yield undesirable effects and which meant non-compliance with convergence criteria tended to dim the prospects of adoption of common monetary policies and currency. However, according to Cobham and Robson (1993); Masson and Pattillo (2001), the WAMZ can become an optimal currency area if they can adopt the unionization strategy of Franco-phone WAEMU.

It is against this backdrop that this paper tries to analyze the effect of monetary policy dynamics on economic performance of WAMZ countries. In line with this objective, the rest of the paper is organized as follows: section II deals with the literature review and theoretical framework, section III contains the model specification and estimation techniques, section IV is the empirical analysis and discussions while section V summarizes and concludes the study.

II. Literature Review

There are two strand of arguments on monetary policy on Macroeconomic performance some are of the view that monetary policies significantly influence macroeconomic performance while some posit that monetary policy is not capable of influencing macroeconomic performance. To this extent, Kamaan (2014) examine effect of monetary policy on economic growth in Kenya using VAR model, the study reveals that one standard deviation monetary policy shock proxied by the Central Bank Rate has a negative and insignificant effect on the output in the first two months which then becomes positive and insignificant in the next four months. However, a one standard deviation shock of the interbank rate to inflation is positive and significant for the first two and a half months. The study concludes that since there is inverse relationship between monetary policy shock and economic growth in Kenya the Central Bank of Kenya should

formulate policies that reduce interest rates to desirable levels and still seek to achieve low levels of inflation.

Nubukpo (2002) analyzed the impact of monetary policy on inflation and economic growth in WAEMU countries using changes in the central bank's leading rates as the main measure of monetary policy. The study essentially argued that a positive shock on the leading rate negatively affects economic growth. The estimation of the growth equation revealed that the Central Bank interest rate policy has a significant but weak impact on the economic activities in the zone. Additionally, based on the findings that the responses to exogenous shocks in both equations are different from country to the other, the study further concludes that there is heterogeneity among the WAEMU countries in terms of their capability to reach the long run equilibrium level in response to a monetary policy implementation.

Ténou (2002) carried out an estimation of a modified Taylor rule for the BCEAO. The modified Taylor rule consists of substituting the inflation gap with the differentials between WAEMU and French inflation rates and interest rates. The BCEAO appeared to react positively to the output gap and to differentials of interest rates and inflation rates, as was expected.

Adamgbe and Agu (2012) evaluate through Dynamic Stochastic General equilibrium models estimated by Bayesian estimation techniques, the monetary policy preferences in the WAMZ which shows that in spite of regional efforts towards achieving convergence, the single digit inflation objective has not been realized. Their analysis shows preferences for output stabilization instead of inflation, an indication of a passive use of monetary policy as a demand management tool.

Akande, *etal* (2005), using descriptive analysis examined the challenges of macroeconomic convergence criteria in the second West Africa Monetary Zone, their study concludes that Nigeria need to sustain her current economic policy reforms to enhance her overall economic performance and to facilitate the process of economic convergence.

Gafa (2013) also analyzed the relative effectiveness of monetary and fiscal policy on economic growth in WAEMU countries using unrestricted VAR based on a modified version of the St Louis model. The results showed that in WAEMU countries, the effect of fiscal policy on growth is more important and lasting relative to monetary policy. However, due to the differences in their macroeconomic structure, the effect of both policies on growth in terms of sign and magnitude differs from one country to the other; promoting growth in WAEMU countries would therefore require the implementation of reforms to improve the quality of public spending.

Balogun (2007) assessed the effect monetary policy and economic performance of West African monetary zone countries (WAMZ), the study used simultaneous equation model and discovered that monetary policy and credit to government hurt real domestic output of these countries, the study further reveal that the transmission mechanism of monetary policy to real sector is two quarter lags. The study concludes that it would be better-off for countries to surrender its independence over these policy instruments to the planned regional body under monetary union arrangement.

Bohl, Mayes and Siklos(2009) examined the quality of monetary policy and inflation performance in 20 OECD countries, using Gravity model, the study concludes that institutional factors have played a role in influencing inflation performance relative to the US experience. Nevertheless, the impact is a more nuanced one than previously imagined

with the bonus created by the introduction of institutional reforms.

Tayo (2014) assessed the effect of monetary policy on economic growth in franc zone for fourteen countries of the Franc zone over the period 1985-2012 using a dynamic panel model. Their results demonstrate a significant and negative effect of domestic credit provided by banking sector on economic growth. The results also reveal that money supply has significant positive effect on economic growth, while total reserves and inflation have a negative effect. However they finally suggested the use of a coordinated optimal mix of policy instruments since to achieve a particular macro-economic objective might not be realistically attainable.

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The majority of the empirical studies above are with varied conclusion. Again the methods applied in the analysis are also diverse. The time frames for most of them are not current. Also the major issues concerning monetary policy are not addressed. It is on this premise that this study tries to fill this void in literature by assessing the relative impact of monetary policy in selected ECOWAS states using VAR.

III. Theoretical Framework and Methodology

3.1 Theoretical Framework

The theoretical basis of the Taylor Rule was refined through several contributions by Svensson (1997, 1999) where he shows that this rule is a solution for an optimal control programme within the standard inflation-targeting framework: the central bank seeks to stabilize inflation at a target level and to limit the cyclic fluctuations of the activity by stabilizing it around its potential level. The macroeconomic model generally used to discuss monetary policy rules is the so-called "neoclassical synthesis" which relied on the New Keynesian Phillips Curve (NKPC) in modelling the development of prices (Taylor, 1998). The NKPS Theory suggested that monetary policy could affect output, even in the short run. One of the main assumptions of Taylor rule is that central bankers are influenced to set interest rates according to the degree of the inflation gap deviation. This has been discussed by economists such as Orphanides (2000) and Svensson (1997, 1999, 2000), who were unsatisfied with such an opportunistic approach to a mechanical monetary policy rule to create stabilization, arguing that it is not sufficient to explain the monetary policy pursued by the Federal Reserve of the USA during the Greenspan period (1987Q3 to 1997Q4).

The theoretical frame work adapted in this study is based on the modified Taylor's rule by Svensson (1997,1999) that posit that monetary policy rule is the solution for an

optimal control programme within the standard inflation-targeting framework.

$$i_t = r^* + \pi_t + \alpha_1 y_t + \alpha_2^* (\pi_t - \pi_t^*) \quad \text{-----} (1)$$

where;

r^* is the Long run equilibrium real interest rate

i_t is the short interest rate taken as monetary policy instrument

π_t is the previous four quarters (including the current one) average inflation

y_t is the output gap calculated as percentage deviation of actual output from the normal level.

π_t^* is the long run inflation target of the central bank

3.2 Research Methodology

In analyzing the effect of monetary policy dynamics on economic performance of WAEMU, the study leans on Four Variable Vector Autoregressive model. Following Sims, et al (1980) argument that VAR models provide a lucid and reliable approach to data description, forecasting, structural inference and policy analysis a VAR approach will be appropriate to address the issues of concern. Besides, adopting a models like this will take care of endogeneity problem.

3.2.1 Model Specification

Following Kamman, 2014, Gafa, 2013, and Balogun, 2007, the adapted version of this study's model specification can be specified below

$$GRGDP = f(DCF, INF, MPR, MS) \text{-----} 1$$

and the explicit version as;

$$\begin{aligned}
GRGDP_t &= \aleph_0 + \sum_{i=1}^p \aleph_1 GRGDP_{1t-1} + \sum_{i=1}^p \aleph_2 MPR_{2t-j} + \sum_{i=1}^p \aleph_3 INF_{3t-j} + \sum_{i=1}^p \aleph_4 DCF_{4t-j} \\
&\quad + \sum_{i=1}^p \aleph_5 MS_{5t-j} + \mu_{t1} \text{-----} 2 \\
MPR_t &= \aleph_6 + \sum_{i=1}^p \aleph_7 MPR_{7t-1} + \sum_{i=1}^p \aleph_8 GRGDP_{8t-j} + \sum_{i=1}^p \aleph_9 INF_{9t-j} + \sum_{i=1}^p \aleph_{10} DCF_{10t-j} \\
&\quad + \sum_{i=1}^p \aleph_{10} MS_{10t-j} + \mu_{t2} \text{-----} 3 \\
INF_t &= \aleph_{11} + \sum_{i=1}^p \aleph_{12} INF_{12t-1} + \sum_{i=1}^p \aleph_{13} GRGDP_{13t-j} + \sum_{i=1}^p \aleph_{14} MPR_{14t-j} + \sum_{i=1}^p \aleph_{15} DCF_{15t-j} \\
&\quad + \sum_{i=1}^p \aleph_{16} MS_{16t-j} + \mu_{t3} \text{-----} 4 \\
DCF_t &= \aleph_{17} + \sum_{i=1}^p \aleph_{18} DCF_{18t-1} + \sum_{i=1}^p \aleph_{19} GRGDP_{19t-j} + \sum_{i=1}^p \aleph_{20} MPR_{20t-j} + \sum_{i=1}^p \aleph_{21} INF_{21t-j} \\
&\quad + \sum_{i=1}^p \aleph_{22} MS_{22t-j} + \mu_{t4} \text{-----} 5 \\
MS_t &= \aleph_{23} + \sum_{i=1}^p \aleph_{24} MS_{24t-1} + \sum_{i=1}^p \aleph_{19} GRGDP_{19t-j} + \sum_{i=1}^p \aleph_{25} MPR_{25t-j} + \sum_{i=1}^p \aleph_{26} INF_{26t-j} \\
&\quad + \sum_{i=1}^p \aleph_{27} MS_{27t-j} + \mu_{t4} \text{-----} 6
\end{aligned}$$

S/N	Variable	Variable	Measurement
1	<i>GRGDP</i>	Economic Growth	Growth Rate of Real Gross Domestic Products
2	<i>INF</i>	Inflation	Year-on Year Headline Inflation
3	<i>MPR</i>	Monetary Policy Rate	Monetary Policy Rate
4	Money Supply	Money Supply	Broad Money Supply
5	DCF	Credit	Credit to Private Sector

IV. Empirical Results and Discussions

4.1 Unit root test Results

The time series properties of each VARIABLE were examined using Augmented Dickey Fuller (ADF) for the countries in order to determine the order of integration of each VARIABLE.

Table 1: Results of Unit Root Test (Nigeria)

VARIABLE(s)	ADF	P-value (level)	ADF	P-value	Remarks
GRGDP	-2.1168	0.2385	-8.0372	0.0000**	$I_{(1)}$
DCF	-1.3343	0.6125	-11.87274	0.0000**	$I_{(1)}$
MPR	-2.2464	0.1911	-11.8497	0.0000**	$I_{(1)}$
INF	-2.8604	0.0526	-11.8325	0.0000**	$I_{(1)}$
MS	-0.7475	0.8301	-11.8689	0.0000**	$I_{(1)}$

NB: $I_{(1)}$ -Stationarity of the VARIABLES at first difference, **Unit root hypotheses are tested at 5%.

Author's computation

Table 2: Results of Unit Root Test (Ghana)

VARIABLE(s)	ADF	P-value (level)	ADF	P-value	Remarks
GRGDP	-2.7351	0.0706	-11.8397	0.0000**	$I_{(1)}$
DCF	-1.8159	0.3716	-11.8504	0.0000**	$I_{(1)}$
MPR	-1.6037	0.4781	-11.8323	0.0000**	$I_{(1)}$
INF	1.7005	0.0996	-5.1940	0.0000**	$I_{(1)}$
MS	-1.0868	0.9973	-4.0023	0.0000**	$I_{(1)}$

$I_{(1)}$ -Stationarity of the VARIABLES at first difference, **Unit root hypotheses are tested at 5%.

Author's computation

Table 3: Results of Unit Root Test (Sierra Leon)

VARIABLE(s)	ADF	P-value (level)	ADF	P-value (First Difference)	Remarks
GRGDP	-2.2452	0.1915	-7.5141	0.0000**	$I_{(1)}$
DCF	-2.5915	0.0971	-11.8341	0.0000**	$I_{(1)}$
MPR	-2.0592	0.2616	-10.1563	0.0000**	$I_{(1)}$
INF	-2.8888	0.0492**		0.0000**	$I_{(0)}$
MS	-1.4807	0.5407	-11.8339	0.0000**	$I_{(1)}$

$I_{(0)}$ -Stationarity of the VARIABLE at level

$I_{(1)}$ -Stationarity of the VARIABLES at first difference

Nb: **Unit root hypotheses are tested at 5%.

Author's computation

Table 4: Results of Unit Root Test (Liberia)

VARIABLE(s)	ADF	P-value (level)	ADF	P-value	Remarks
GRGDP	-3.1050	0.0284**			$I_{(0)}$
DCF	-0.8215	0.6125	-11.87274	0.0000**	$I_{(1)}$

MPR	-2.1918	0.1911	-11.8497	0.0000**	I ₍₁₎
INF	1.1571	0.0526	-35.5765	0.0000**	I ₍₁₎
MS	-2.1327	0.8301	-11.8363	0.0000**	I ₍₁₎

I₍₀₎.Stationarity of the VARiAbLe at level

I₍₁₎.Stationarity of the VARiAbLes at first difference

Nb: Unit root hypotheses are tested at 5%.

Author's computation

Table 5: Results of Unit Root Test(Gambia)

VARiAbLe(s)	ADF	P-value (level)	ADF	P-value	Remarks
GRGDP	-2.1168	0.2385	-8.0372	0.0000**	I ₍₁₎
DCF	-1.3343	0.6125	-11.87274	0.0000**	I ₍₁₎
MPR	-2.2464	0.1911	-2.8776	0.0000**	I ₍₁₎
INF	-2.8604	0.0526	-11.8749	0.0000**	I ₍₁₎
MS	-0.7475	0.8301	-12.1195	0.0000**	I ₍₁₎

I₍₁₎.Stationarity of the VARiAbLes at first difference

Nb: **Unit root hypotheses are tested at 5%.

Author's computation

4.2 Cointegration Test

Given that for Nigeria, Ghana and Gambia, Togo all the VARiAbLes are found to be I(1) while Sierra Leone and Liberia have some VARiAbLes to be integrated of order one, and the Johansen's cointegration test is used to determine the number of cointegrating relationships among the VARiAbLes. If the VARiAbLes are cointegrated, there exists a stationary linear combination which is called the cointegrating equation.

Table 6: Johansen Cointegration (Nigeria)

Hypothesize d		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.529467	151.1936	69.81889	0.0000
At most 1 *	0.266759	73.54300	47.85613	0.0000
At most 2 *	0.203116	41.58401	29.79707	0.0014
At most 3 *	0.116841	18.19828	15.49471	0.0191
At most 4 *	0.051082	5.400570	3.841466	0.0201
Trace test indicates 5 cointegratingeqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Table 7: Johansen Cointegration Results (Ghana)

Hypothesize d		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.313222	94.14488	69.81889	0.0002
At most 1	0.120721	41.16485	47.85613	0.1835
At most 2	0.074837	23.02476	29.79707	0.2448
At most 3	0.060541	12.05707	15.49471	0.1542
At most 4	0.022797	3.251530	3.841466	0.0714
Trace test indicates 1 cointegratingeqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Table 8: Johansen Cointegration Results (Sierraleon)

Unrestricted Cointegration Rank Test (Trace)				
Hypothesize d		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.304373	175.9349	69.81889	0.0000
At most 1 *	0.260875	125.1230	47.85613	0.0000
At most 2 *	0.250062	82.80265	29.79707	0.0000
At most 3 *	0.250000	42.51564	15.49471	0.0000
At most 4	0.015874	2.240151	3.841466	0.1345
Trace test indicates 4 cointegratingeqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Table 9: Johansen Cointegration Test (Liberia)

Hypothesize d		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.437286	89.98857	69.81889	0.0006
At most 1 *	0.383338	57.21453	47.85613	0.0052
At most 2	0.298375	29.65874	29.79707	0.0519
At most 3	0.147650	9.460430	15.49471	0.3245
At most 4	0.006195	0.354238	3.841466	0.5517
Trace test indicates 2 cointegratingeqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Table 10: Johansen Cointegration test (Gambia)

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.248849	100.0934	69.81889	0.0000
At most 1 *	0.174276	59.74641	47.85613	0.0026
At most 2 *	0.121468	32.74574	29.79707	0.0222
At most 3	0.085934	14.48576	15.49471	0.0705
At most 4	0.012800	1.816505	3.841466	0.1777
Trace test indicates 3 cointegratingeqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

From Table 5-10, it is evident that the Johansen Cointegration test for Nigeria suggests there are five Cointegrating equations, for the case of Ghana, there is one Cointegrating equation. As for the Sirrealeone four Cointegrating equations exists. The maximum Eigen value for Gambia suggests two Cointegrating equations while that of Liberia suggest five Cointegrating equations

4.3 Impulse Response Function

In order to trace the effect to a one-time shock to one of the innovations on current

and future values of the endogenous VARIABLES, the study employed the impulse response function. The Cholesky ordering was used to transform the impulses. It uses the inverse of the Cholesky factor of residual coVARIance matrix to orthogonalize the impulses. The estimated IRFs are presented in different graphs in Appendix. But in order to help the discussion, selected IRFs from the VAR model of each country are reported below. The VARious graphs show the response of real GDP growth and Inflation rate to shocks in monetary policy.

Figure 1: Selected Impulse response functions from the VAR model for (Nigeria)

Response to Cholesky One S.D. Innovations ± 2 S.E.

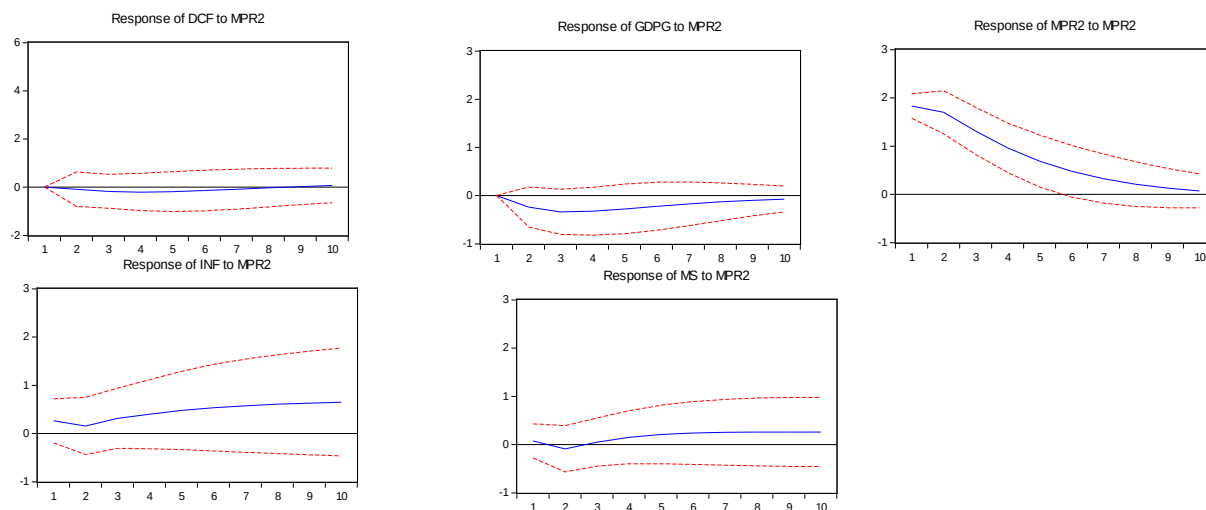


Figure 1 above which shows the impulse response function for Nigeria reveal clearly that a shock from monetary policy rate has an insignificant effect on domestic credit by financial institution and started declining from second quarters, while shock from monetary policy retard growth rate of real gross domestic over the quarters, suggesting that monetary policy only is in capable of bringing

growth in Nigeria. A shock to monetary policy rate was negative to itself over the time frame, one standard deviation shock decreases inflation rate from initial period up till second quarters and started increasing from the third quarters and lastly the response of money supply to shock in monetary policy was negative from the initial period, but started increasing from the third quarters.

Figure 2: Selected Impulse response functions from the VAR model for (Ghana)

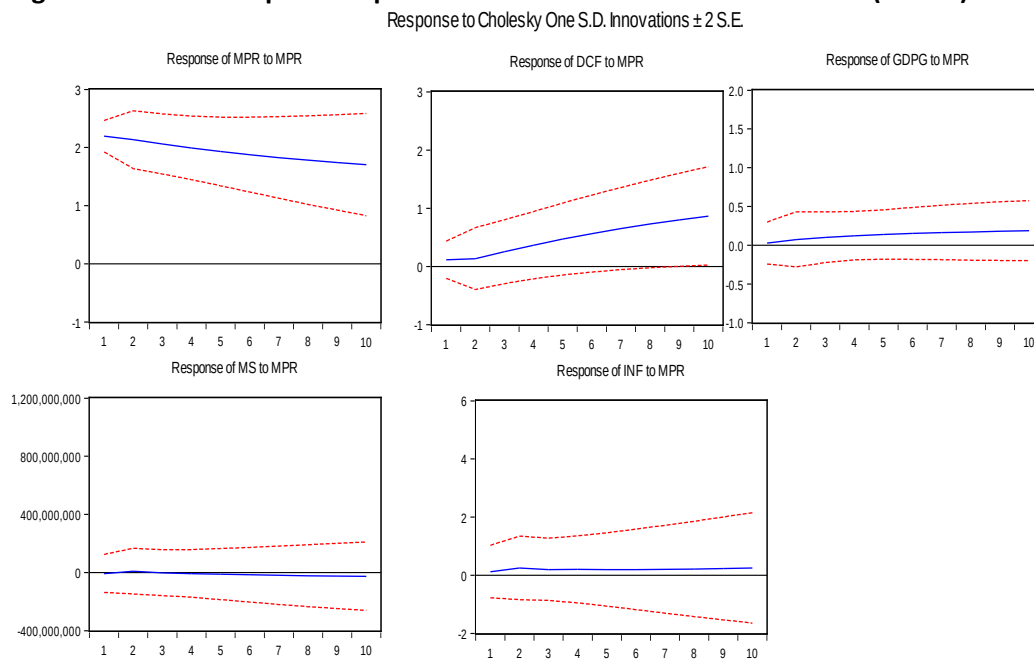


Figure 2 above shows the impulse response function for Ghana divulge evidently that a standard deviation shock from monetary policy declines over the quarters on itself, while shock to domestic credit by financial institutions increases in the first quarters but started decreasing towards the end of the first quarters and started increasing from second quarters, response of Real GDP growth rate

didn't has much effect in the first quarters but picked up in the second quarters, while the shock in monetary policy to inflation rate was insignificant from the initial period but started declining towards the fifth quarters, lastly the response of inflation from one standard deviation shock in monetary policy was positive at the initial period but decline in the second period

Figure 3: Selected Impulse response functions from the VAR model for (Sierra Leon)

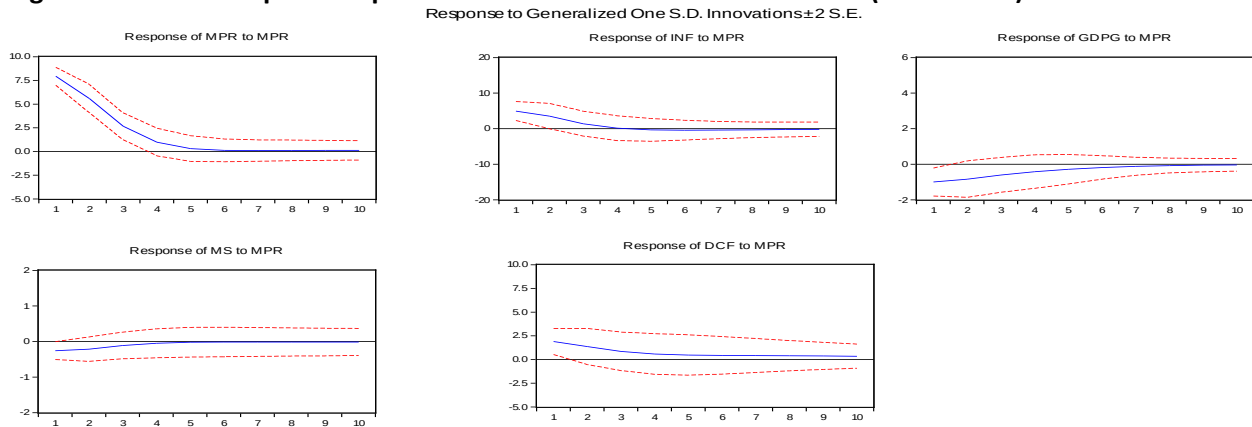


Figure 3 above demonstrates the impulse response function for Sierra Leon which divulge evidently that a standard deviation shock from monetary policy positively affect itself in the first period but declines over the quarters and was insignificant from the fifth quarters, while shock to inflation rate was positive in the first quarters but started declining towards the second quarters and was insignificant in the third quarters upward.

One standard deviation shock to Real GDP growth was negative from the initial period but took effect in the 8th quarter which is insignificant, while shock to money supply at the initial period was negative but insignificant towards the 5th quarter, lastly response of domestic credit by financial institution was positive in the initial period but started declining after the second quarter

Figure 4: Selected Impulse response functions from the VAR model for (Liberia)

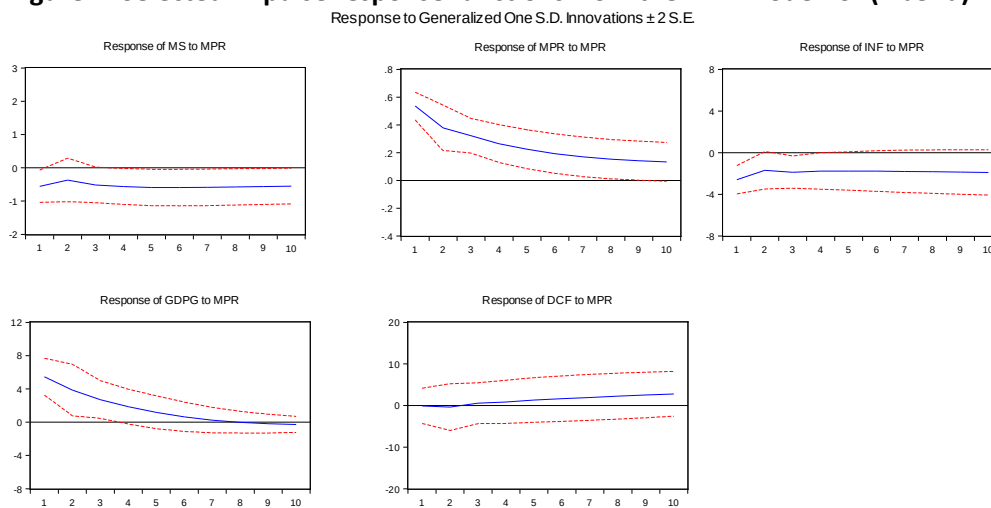


Figure 4 above exhibits the impulse response function for Liberia which discloses patently that a standard deviation shock from monetary policy was negative to money

supply throughout the periods and the response to monetary policy rate itself increased at the initial period but started declining towards the second quarter. Shock

to inflation was negative throughout the periods. A standard deviation shock to real GDP growth rate increased in the first quarters, but started decreasing towards the mid-4th quarter and insignificant in the 8th

quarter. Lastly response to domestic credit by financial institution was insignificant from the first period but started increasing towards the fourth quarter

Figure 5: Selected Impulse response functions from the VAR model for (Gambia)

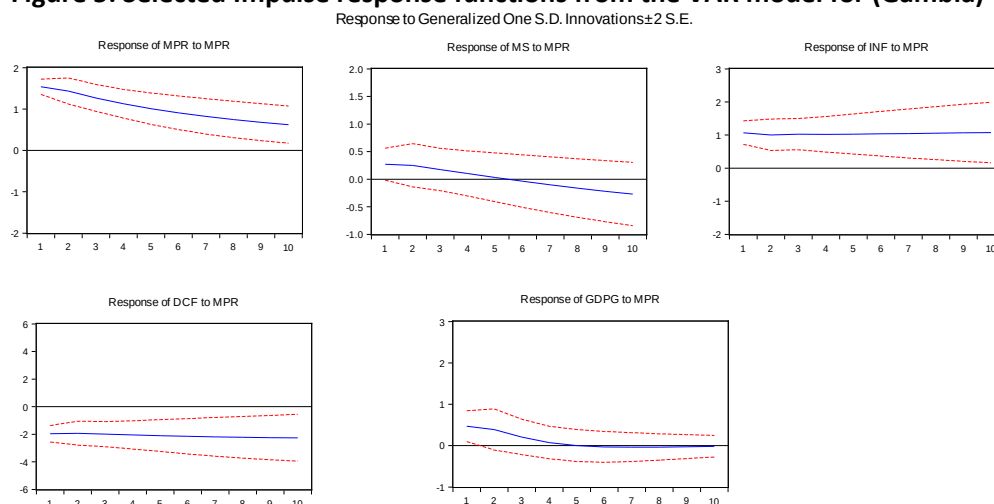


Figure 5 above exhibits the impulse response function for Gambia which reveals clearly that a standard deviation shock from monetary policy to itself increased in the first period but was started declining after the second quarter while responds to money supply was positive from the first period and declining in the third quarter, but negative in the sixth quarter. Inflation as well was positive, while domestic credit by financial institution was negative throughout the period. Lastly, the repose of real GDP growth rate increased from the first period to 4th quarter but was insignificant toward the fifth quarter.

V. Policy Suggestions and Conclusions

In order to provide a better understanding of the connections between monetary and growth and inflation targeting in the WAMZ zone, the study examined the relative effectiveness of monetary policy on growth in WAMZ countries (Nigeria, Ghana, Liberia, Gambia and Sierra Leone). A VAR model with

Quarterly data was used over the sample period 1981-2015 and the VARiables are Real GDP Growth rate, Money Supply, Inflation rate, Domestic credit by financial institution and Monetary Policy Rate. The cointegration test conducted for all the countries revealed that there is a long run relationship among all the VARiables examined. The results from the VECM divulge that monetary policy has negative and insignificant effect on Real GDP growth rate and inflation in Nigeria and Ghana, monetary policy has positive and negative effect on Economic growth and inflation in lagged quarter one and two in Sierra Leone and Liberia respectively, while lastly in Gambia monetary policy has positive effect on inflation and Growth.

From the IRFs, it is clear that in WAMZ countries, monetary policy has almost no effect on growth in Nigeria, Ghana and Sierra Leone, but monetary policy shock increases growth in first quarters and decline towards second quarters in Liberia and Gambia. As for

inflation monetary policy shock implication is similar in Nigeria, Ghana and Liberia but was positive in Gambia and Sierra Leone.

Based on the above results, it is suggested that fostering growth in these countries could require a monetary policy relaxation. Also, BCEAO should therefore increase its liquidity provision through its open market operations and lowering its reserve requirement.

Moreover, one of the reasons why monetary policy is virtually ineffective in WAMZ can be attributed to the presence of excess liquidity in the financial market

(Founda, 2009). This could also be one of the reasons why the study finds a negative elasticity associated with monetary policy in some of the countries, this excess liquidity can be due to the limited development of the interbank market making the access to credit difficult to the private sector, in this regard, the priority of the authorities should be the implementation of reforms that can help improve liquidity trading in the financial market, support the development of the financial market, strengthen financial intermediation and increase access to credit

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